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# How will the evolution of smart cities impact the insurance industry?

The future is often nearer than you think. Sometimes it takes a single trigger to accelerate change on an unforeseen scale.

The societal and work restriction brought about by Covid-19 has shown that incremental business models can be boosted by a single crisis: take, for example, online shopping. In the USA, market share of online shopping has been growing at 1% a year. Due to the national lockdown, that number ballooned from 18% to 28% - that's a decade's growth in 2 months. Post the lockdown, this figure will almost certainly drop but it is expected that it will settle at a level that represents at least a few years' worth of growth due to newer adoptions and understanding the value proposition of a new buying channel.

The promise of smart cities has captured the imagination of futurists for decades – however, it has yet to see fruition in its envisaged form – but the explosion of emerging technologies in the recent past shows that it will be an evolution rather than

a sudden transformation. The consequence of this is that the smart city concept will not be restricted to only developed countries – but that it will find solutions in emerging economies as well, albeit for different purposes e.g. the technologies that enable smart parking in Dubai will find application in preventing crime in Johannesburg. This will impact the ancillary industries, like insurance – both in a negative and positive way. Anticipating these changes and positioning for it will be key for insurers going forward.

## What is a smart city?

A smart city is one that collects large amounts of data using the internet of things (IoT) from a wide variety of sources through the connected network of hardware, software, sensors, devices and human input (e.g. social media) to deliver an efficient service system – ultimately for the benefit of its residents. These systems include public and private transport, waste management, environmental monitoring etc. As an example, it will make use of transport related information like traffic data and combine this with other types of data, like weather conditions, to predict urban traffic flow with enhanced accuracy.

## How will smart cities evolve in emerging markets?

Smart cities are underpinned by technology – its availability, access and cost. Allied to this is the concept of collaboration between multiple service providers to leverage collective data. Wi-Fi and mobile technology are critical enablers. Emerging markets are hampered by a dearth of these enabling factors – but this does not imply that smart city benefits are not attainable, rather they will evolve over time. Indeed, for certain countries, there are potential drivers that may even accelerate this. These include:

- Rapid urbanisation with younger populations and a different set of societal needs;
- no legacy systems like old transport infrastructure; and
- increasing mobile connectivity.

## Local considerations will dictate the pace of evolution

Take South Africa for example, the public transport system is limited, and private owned minibus taxis are the de facto public service transport system, yet it is largely unregulated. Any smart city solution would have to consult with this important stakeholder group. Many informal settlements within the city limits, where a significant amount of the population resides experience poor basic service delivery. There is also the existing tension between providing for basic needs vs digital enablement. Therein lies a significant opportunity for innovators to use the latter to enable the former.

## What will the evolution to a South African smart city look like?

It will be challenging to manage the full-scale digital transformation of a South African city – therefore it will be gradual and, unfortunately, siloed. We expect that innovative companies will focus on specific solutions and aggregators will develop solutions on the back of those. For example, different companies may install cameras to reduce crime in different parts of the city, yet an aggregator may use the camera feeds from all these providers to determine traffic patterns to suggest route optimisations to individual drivers.

These are several specific use cases for smart city technologies that are immediately implementable or are already in progress:

- Visual monitoring – street, building, pedestrian and vehicle-based camera systems;

- Environmental monitoring – air quality, noise;
- Ride hailing/ride sharing – already offered by Uber, Lyft;
- Route optimisation – apps like Waze; and
- IoT sensors – water leaks, lighting malfunctions.

Some of these could already lend themselves to aggregation: e.g. use of existing camera feeds determine traffic patterns, parking availability, potholes, water leaks, illegal waste dumping etc.

Considering that network devices are set to increase to more than 50 billion devices by 2025<sup>1</sup>, many of which are equipped with a plethora of sensors from GPS, accelerometers, pedometers, proximity sensors and gyroscopes, the volumes and value of data being generated by these devices, linked to specific, recognisable individuals (thanks to the RICA Act) are ripe for aggregation and use in providing enhanced insurance products.

Up until now, insurers have mainly used IoT capabilities to aid interactions with customers and simplify or accelerate underwriting and claims processing. Auto insurers, for example, have historically relied on indirect indicators, such as the age, address, and creditworthiness of a driver, when setting premiums. Now, data on driver behaviour, such as how fast the vehicle is driven and how often it is driven at night, are available, resulting in some insurers adjusting premiums based on behaviour. Insurers are also using feeds from wearable devices to encourage improved wellness behaviour, or geyser monitoring systems to initiate auto maintenance prior to a burst.

This enhanced customer view allows for direct customer interaction and specific insurance cross-selling of

products, based on an individual's behaviour. If an insurer detects a customer in the vicinity of an airport, they may offer instant travel or flight cancellation insurance.

Soon, we expect to see auto dispatch of emergency services after an accident. Another area that will benefit greatly from the use of technology is insurance fraud. Insurance fraud continues to be a significant issue that insurers are dealing with.

The use of technology, especially IoT sensor data, can help in recognising fraudulent claims. One example is reconstructive analysis of accidents based on pictures taken at the accident combined with telematic information (e.g. speed, driver corrective action) correlated with the actual extent of damage to a vehicle. This can prevent "padding" of claims by excluding prior damages that could not be attributed to the current incident. This analysis would also help attribute the extent of contributory negligence of the drivers involved.

It is quite clear that the many applications for smart city technologies are already present and will be implemented soon.

## What will the new risks be?

Of course, with every change in technology, there is a set of new risks.

Cyber-risk will undoubtedly increase as more people, places, and things become connected and generate data. Hacking of an integrated smart city system can be catastrophic. Imagine a hacker changing the timing of traffic lights. Different kinds of infrastructure risks may arise due to malfunctioning software.

Theft and damage to physical and digital infrastructure is an ever-present risk, particularly since much of this type of infrastructure can be repurposed. Privacy concerns will also come to the fore, given the ability of companies or the State to track every citizen's movement and activity.

## What are the implications for insurers?

The most recognisable development in smart city technology is arguably the technology introduced by ride hailing companies, which are now developing additional solutions like food and parcel delivery. Combined with working from home touted to become the new "normal", this has the immediate outcome of reducing the amount of private distance travelled. Bringing in new insurance models, the following scenario becomes realistic:

Most insurance products currently offered are time based (i.e. monthly premiums) rather than usage based – this represents an opportunity for clients to start balancing the benefits of both types of insurances for each of their assets. Clients will obviously see the arbitrage opportunity of insuring low usage items via usage-based insurance and time based for high usage assets. Time-based insurers may lose the client premium completely if they do not offer usage-based products too.

The rise in ride hailing services has led to another well-known trend - lower vehicle ownership, less distance travelled, fewer accidents and lower severity of accidents. Each of these presents either an opportunity or a threat to insurers. Lower ownership means fewer insurable assets while fewer accidents means lower pay-outs. The balance between these factors will mean a relook at existing risk models and an increase in the

extent to which insurance products are personalised. Route optimisation may lead to other intangible benefits like less time on the road, higher quality of life, better air quality and less congestion.

Service delivery is an obvious beneficiary of smart city technology, e.g. cameras that detect water leaks, fires, accidents and immediately contact emergency centres while managing traffic light timings to ensure the fastest route for emergency response vehicles.

Remote working is also a key feature of smart cities. Although this was gradually trending in the workplace, the Covid-19 pandemic has accelerated it. We expect that many employers will shift towards remote working as a permanent feature for many of their staff – again leading to less traffic, less inclination towards multiple car ownership, use of ride hailing services and an increase in usage based or demand adjusted insurance.

Many of the digital trends point towards fewer vehicles and pedestrians on the road and therefore have an expected correlation on safety and crime. Coupled with connected cameras and vehicle tracking one can envisage fewer muggings and fewer instances of car hijacking and petty theft and more successful arrests.

Given the proliferation of technologies, the breadth of application is limited only by imagination and emerging market economies have the potential to solve several problems simultaneously by leveraging these technologies.

Insurers will also face business dilemmas due to a rise in cyber-risk, including the potential for hackers to take control of infrastructure and the challenge of keeping personal data protected. Insurers need mechanisms for ascribing blame when autonomous systems fail.

Risks will also potentially grow in magnitude, i.e. there may be a decreased frequency of insurable events but an increased severity of accidents (mega-events). An example is of a power failure which then renders most of the smart systems inoperable i.e. an over-dependence on automated technology which may cause more, rather than fewer accidents.

## Conclusion

Clearly insurers need to be aware of the smart city trend and track the developments and opportunities both in technology and customer behaviour. There is an opportunity for insurers to develop new products, improve their risk models and understand risks at a more granular level. Smart cities are pushing the connected world agenda even further and insurers must start developing competencies in emerging technologies and their implications – this will have a far reaching and permanent effect on the insurance industry.

// Enthusiasm  
is common.  
Endurance is rare. //

- Angela Duckworth